

NRC/VIC/Visual Ergonomics  
Pekka Pihlaja

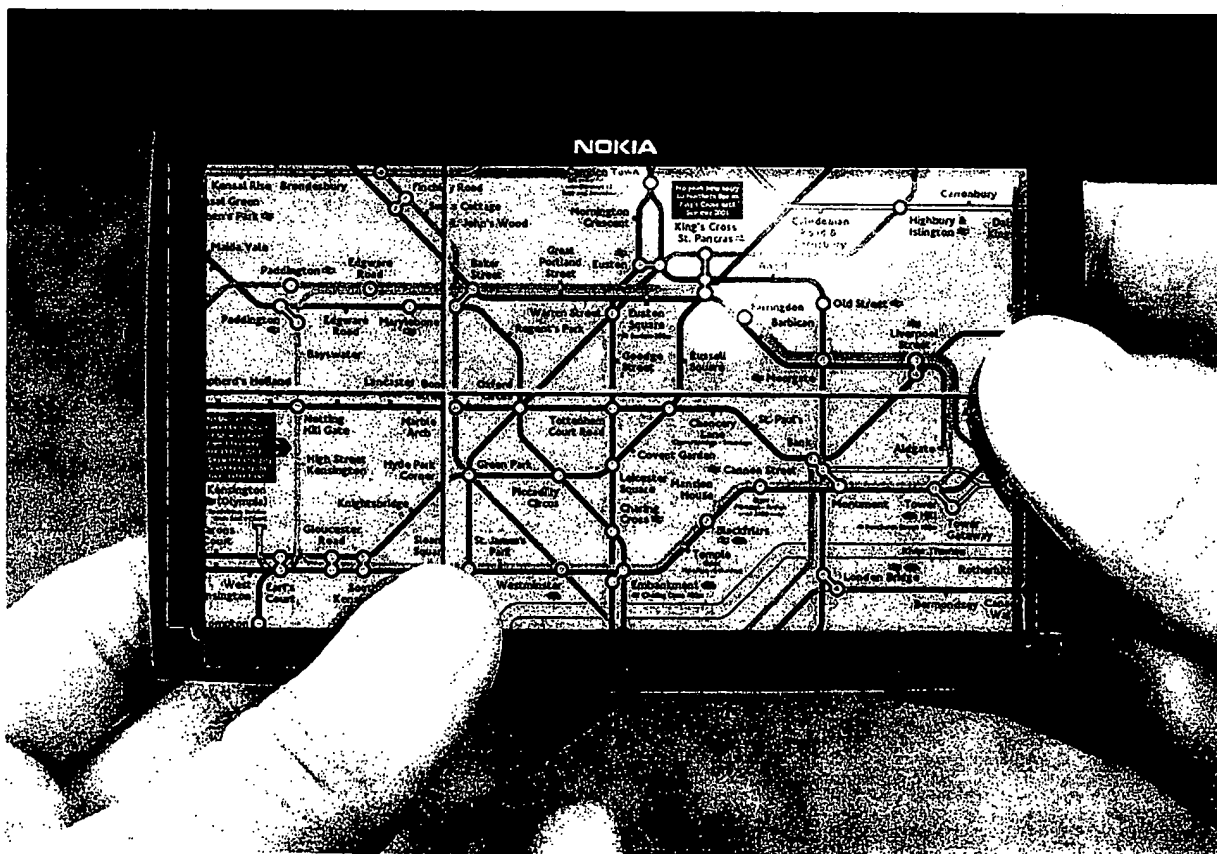
15.10.2001

**Title of the invention: Minibrowser – A Phone Form Factor  
Optimized for Viewing Web Pages  
Inventor: Pekka Pihlaja**

**Summary**

A web page is browsed in two dimensions by means of a touch-pad on the back of the phone. The page is pointed to with crosshairs controlled by thumbs on two perpendicular position sensitive strips on the sides of the display. A third strip is used for zooming. The earphone is placed under the touchpad on the back of the phone to save space for the display in the front. Sound passes through holes in the touch-pad.

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Minibrowser

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## **Background**

When ships switched from using the traditional large paper maps to electronic maps displayed on much smaller displays, one interviewed captain said it is like "viewing a map through a keyhole". The same will happen to web pages as they will be accessed with mobile phones. An efficient method of 2D-scrolling, zooming and pointing to a page has to be developed to overcome the narrow view offered by a small display.

An obvious interface for a pocket size device with the biggest possible display is a stylus-operated touch-screen. There are some problems to this approach however:

- Present touch-screens deteriorate image quality. This problem may be alleviated in the future with the introduction of HALIOS-touchscreens.
- The hand needed for holding the device could be used for zooming the page, but not much else.
- The stylus (or finger) can be used for either browsing or pointing, and the user would have to switch back and forth between the two modes.
- Pointing with a stylus is difficult when on the move.

## **Detailed Description of the Invention**

The Minibrowser form factor utilizes four inventions:

- Position sensitive strips on three sides of the display (Panu Korhonen, 1998, and Pekka Pihlaja, 2000)
- Touch-pad on the back of the phone (by Miika Silfverberg)
- Earphone under the touch-pad (by Pekka Pihlaja). This invention is presented here for the first time

## **Operating the Minibrowser**

**Browsing a web page:** The touch-pad on the back of the device is used to browse the page in the display. This should feel like touching the page from behind with a finger and moving it.

**Pointing to a web page:** Two perpendicular position sensitive strips are used for pointing. Crosshairs emanate from the points where the strips are touched. For further information see NC-18902. The great benefit is, that even the big thumbs can be used for accurate pointing with absolute position control, even when on the move. Alternatively the touchpad can be used for pointing and strips for browsing.

To give the user feedback of selecting, the strips can be mounted on domes.

**Zooming a web page:** The third strip is used for zooming. The user can define which strip is used for zooming and which ones for browsing – operating is equally easy for both right and left handed users.

**Phone user interface:** The different positions of the strips can be used as soft keys or hard keys. One hand use of important phone functions is possible.

**Text input:** The pointing method described above is quite intuitive and fast. A usability test done on a mechanical prototype showed, that it is fast enough for writing on a soft keyboard (Tuomainen, 2001).

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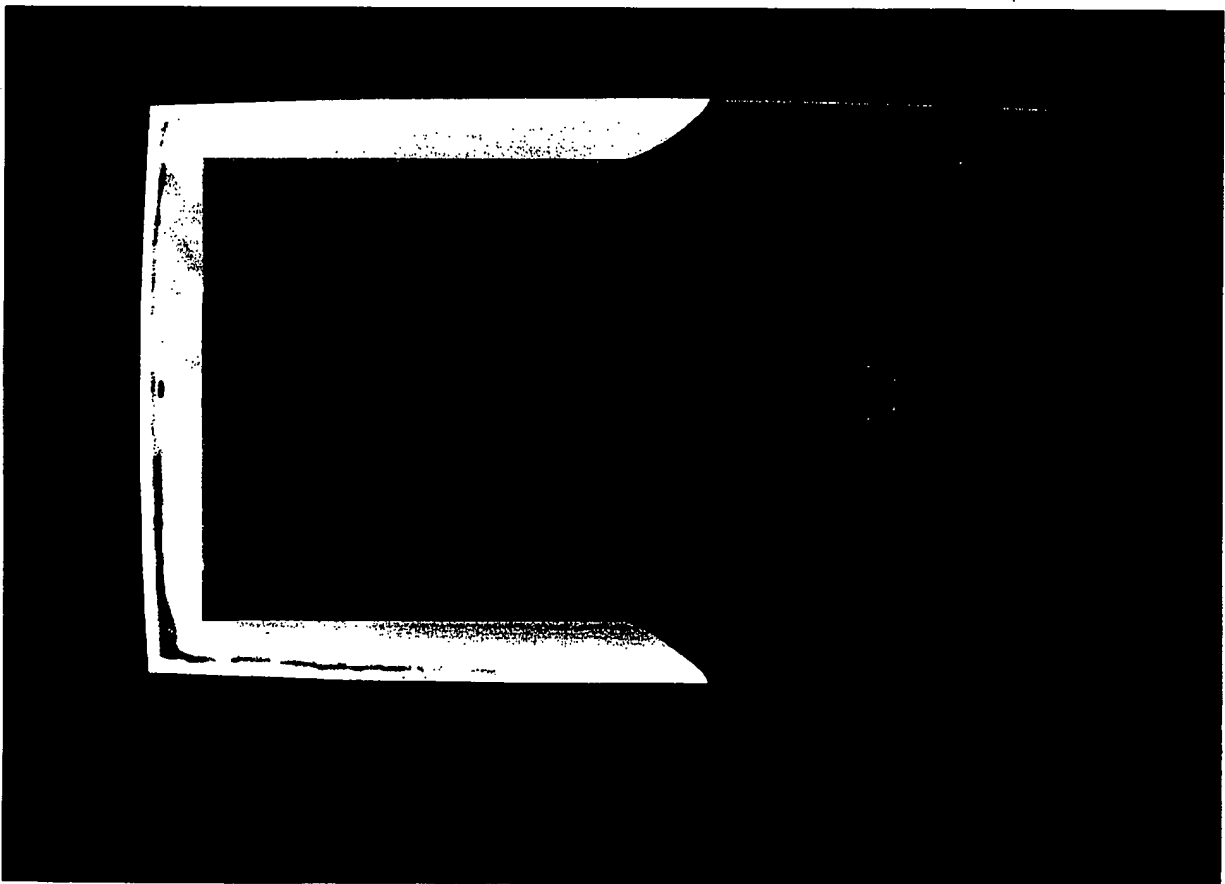
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**Talking on the phone:** To save space for the display on the front face, the earphone has been placed under the touch-pad on back of phone. There are holes in the touch-pad for the sound to go through.

According to audio experts this is possible, provided that the touch-pad is rigid enough not to change its thickness due to sound pressure. Such a touch-pad could be implemented, for example, with an optical HALIOS sensor system or an EMFi sensor. The principle should work also on membrane keypads.

Placing the earphone under a touch-pad or a membrane keyboard saves space even if it is on the front face of the phone. This kind of configuration could be implemented on a "horizontal" phone.

During a call the touch-pad on the back of the phone should be automatically disabled to avoid unintentional activation.



**Minibrowser from the back**

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### **Benefits of the invention**

- **Maximized display size.**
- **Easy 2D-scrolling, zooming and pointing to the page. Scrolling and zooming can be done simultaneously.**
- **Accurate and fast pointing with absolute position control, even when on the move.**
- **Text Input with a soft keyboard.**
- **The sensor strips can be used for soft keys. One hand use of most important phone functions is possible**
- **Equally easy for right and left handed users.**
- **Can be directly implemented on the Belinda communicator concept (NC-19087, patent pending).**
- **The sensor strips and the touch-pad can be implemented using the same technology, for example HALIOS.**
- **Interesting possibilities for new games.**

### **Additional information**



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Invention report - NRC Inventions (IMS) Help?

## NC19317 Minibrowser - A Phone Form Factor Optimized for Viewing Web Pages

Nobody can edit the description after this report is submitted for evaluation. ?

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Employee number(s) ?

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One sentence crystallization of the invention ?

One paragraph description of the invention ?

**A web page is browsed in two dimensions by means of a touch-pad on the back of the phone. The page is pointed to with crosshairs controlled by thumbs on two perpendicular position sensitive strips on the sides of the display. A third strip is used for zooming. The earphone is placed under the touchpad on the back of the phone to save space for the display in the front. Sound passes through holes in the touch-pad.**

Related project ?

**No project**

In my opinion the invention belongs to category

(not necessary to fill in) ?

Publication date (e.g.15-Jan-2001) ?

Place or method of publication: ?

I/we consider the invention to belong to the category indicated above and to my/our best knowledge, I am / we are the sole and original inventor(s) of this invention. The company may, by virtue of the valid legislation, be entitled to full or partial rights to the invention. I/we acknowledge my/our obligation to sign as inventor(s) all documents that may be required for protecting the invention in different countries.

Signature of inventor(s) ?

Date:

**29-May-2001**

Signature:

**Pekka Pihlaja**

Other technical information or attachments: ?



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